

Supplemental Materials

Supplementary file appendix 1. Urinary cotinine ^a levels in adults (≥18 years) pre and post an indoor hookah-only social event, by smoking status (N=208).

| | Hookah-only Social Event (N=208) | | | |
|---|----------------------------------|-----------------------|-----------------------|-----------------------|
| | ng/mL ^b | | | |
| | Pre Event | Post Event | Ratio ^c | <i>p</i> ^d |
| All Hookah Smokers (n=105) | | | | |
| M ± SD ^e | 157.1 ± 259.5 | 303.2 ± 354.5 | | <0.001 |
| GM (95% CI) ^f | 15.2 (8.5-27.0) | 135.7 (99.9-184.2) | 8.9 | |
| Median (5-95percentile) | 41.3 (0.2-699.9) | 146.7 (14.4-984.9) | 3.6 | |
| (Minimum-Maximum) | (0.03-1135.0) | (0.2-1733.6) | | |
| % above LOD (Freq/n) ^{g, h, i} | 98% (101/103) | 100% (104/104) | | |
| Daily Hookah Smokers (n=20) | | | | |
| M ± SD | 248.4 ± 246.4 | 452.3 ± 320.3 | | <0.001 |
| GM (95% CI) | 128.9 (61.8-268.6) | 287.9 (147.1-560.9) | 2.2 | |
| Median (5-95percentile) | 174.3 (2.7-780.6) | 397.5 (17.8-1119.6) | 2.3 | |
| (Minimum-Maximum) | (1.6-1032.8) | (1.8-1182.1) | | |
| % above LOD (Freq/n) | 100% (20/20) | 100% (20/20) | | |
| Weekly Hookah Smokers (n=46) | | | | |
| M ± SD | 191.1 ± 288.9 | 343.5 ± 368.8 | | <0.001 |
| GM (95% CI) | 32.6 (15.1-70.1) | 176.0 (117.9-262.9) | 5.4 | |
| Median (5-95percentile) | 76.8 (0.2-964.5) | 158.5 (15.8-959.2) | 2.1 | |
| (Minimum-Maximum) | (0.1-1135.0) | (2.3-1733.6) | | |
| % above LOD (Freq/n) | 100% (46/46) | 100% (46/46) | | |
| Occasional Hookah Smokers (n=39) | | | | |
| M ± SD | 65.4 ± 198.97 | 175.8 ± 318.0 | | <0.001 |
| GM (95% CI) | 1.9 (0.75-4.5) | 66.7 (38.9-114.4) | 35.1 | |
| Median (5-95percentile) | 0.8 (0.03-699.9) | 71.6 (1.0-984.9) | 89.5 | |
| (Minimum-Maximum) | (0.03-993.8) | (0.2-1709.9) | | |
| % above LOD (Freq/n) | 95% (35/37) | 100% (38/38) | | |
| Non-Smokers (n=103) | | | | |
| M ± SD | 0.9 ± 1.61 | 2.0 ± 5.44 | | <0.001 |
| GM (95% CI) | 0.3 (0.2-0.4) | 0.9 (0.7-1.1) | 3.0 | |
| Median (5-95percentile) | 0.3 (0.03-4.7) | 0.9 (0.2-5.1) | 3.0 | |
| (Minimum-Maximum) | (0.03-9.9) | (0.03-43.9) | | |
| % above LOD (Freq/n) | 83% (85/102) | 98% (100/102) | | |
| | <i>p</i> ^j | <i>p</i> ^j | <i>p</i> ^k | |
| Daily vs. Weekly | 0.046 | 0.084 | 0.270 | |
| Daily vs. Occasional | <0.001 | <0.001 | 0.001 | |
| Daily vs. Non-smoker | <0.001 | <0.001 | <0.001 | |
| Weekly vs. Occasional | <0.001 | 0.003 | 0.053 | |
| Weekly vs. Non-smoker | <0.001 | <0.001 | <0.001 | |
| Occasional vs. Non-smoker | 0.001 | <0.001 | <0.001 | |

^a Cotinine is a metabolite of nicotine.

^b Cotinine values are not corrected with creatinine (ng/mL).

^c Ratio = Ratio of post to pre hookah event cotinine GMs and medians.

^d *p* Hookah events: pre vs. post event.

^d *p* values were derived from Wilcoxon signed-rank tests.

^e M ± SD = Arithmetic mean and Standard Deviation.

^f GM (95% CI) = Geometric mean and 95% Confidence Interval.

^g % Above LOD = Percentage of urine samples above the Limit of Detection (LOD); cotinine LOD = 0.1 ng/mL.

^h Freq/n = Frequency of samples with levels above the LOD / n-size of samples per group.

ⁱ Missing values due to interference (n=4) or missing urine samples (n=1).

^j *p* Cotinine levels by smoking frequency status.

^k *p* Pre to post event change in cotinine levels by smoking frequency status.

^{j, k} *p* values were derived from Mann-Whitney U tests.

Significant levels are bolded; two-tailed alpha level *p* < 0.05.

Supplementary file appendix 2. Urinary levels of cotinine^a pre and post hookah-only indoor social events at hookah-lounges vs. at home, by smoking status (N=208).

| | <u>Hookah Lounge</u> | | | | <u>Home</u> | | | | |
|--|----------------------------------|--------------------|--------------------|-----------------------|----------------------------------|--------------------|--------------------|-----------------------|-----------------------|
| | Hookah-only Social Event (n=108) | | | | Hookah-only Social Event (n=100) | | | | |
| | ng/mL | | | | ng/mL | | | | |
| | Pre Event | Post Event | Ratio ^b | <i>p</i> ^c | Pre Event | Post Event | Ratio ^b | <i>p</i> ^d | <i>p</i> ^e |
| All Hookah Smokers (n=105) | | | | | | | | | |
| M ± SD ^f | 136.4 ± 242.9 | 300.3 ± 348.2 | | <0.001 | 178.9 ± 276.7 | 306.2 ± 364.7 | | <0.001 | 0.810 |
| GM (95% CI) ^g | 12.3 (5.5-27.4) | 139.4 (92.0-211.4) | 11.3 | | 19.0 (8.1-44.7) | 131.8 (82.8-209.8) | 6.9 | | |
| Median (5-95percentile) | 30.2 (0.2-699.5) | 133.4 (15.3-959.2) | 4.4 | | 67.5 (0.1-993.8) | 162.6 (2.3-1057.2) | 2.4 | | |
| (Minimum-Maximum) | (0.03-1083.5) | (0.2-1709.9) | | | (0.03-1135.0) | (1.1-1733.6) | | | |
| % above LOD ^h (Freq/n) ^{i,j} | 98% (52/53) | 100% (54/54) | | | 98% (49/50) | 100% (50/50) | | | |
| Non-Smokers (n=103) | | | | | | | | | |
| M ± SD | 0.9 ± 1.7 | 3.1 ± 7.5 | | <0.001 | 0.9 ± 1.5 | 0.9 ± 0.9 | | 0.044 | 0.002 |
| GM (95% CI) | 0.3 (0.2-0.5) | 1.2 (0.9-1.7) | 4.0 | | 0.3 (0.2-0.5) | 0.6 (0.4-0.8) | 2.0 | | |
| Median (5-95percentile) | 0.3 (0.03-4.7) | 1.1 (0.3-14.8) | 3.7 | | 0.4 (0.03-5.7) | 0.5 (0.1-2.7) | 1.3 | | |
| (Minimum-Maximum) | (0.03-9.8) | (0.2-44.0) | | | (0.03-7.3) | (0.03-4.1) | | | |
| % above LOD (Freq/n) | 85% (44/52) | 100% (52/52) | | | 82% (41/50) | 96% (48/50) | | | |

^a Cotinine is a metabolite of nicotine. Cotinine values are not corrected with creatinine (ng/mL).

^b Ratio = Ratio of post to pre hookah event cotinine GMs and medians.

^c *p* Hookah lounge: pre vs. post event.

^d *p* Home: pre v post event.

^{c, d} *p* values were derived from Wilcoxon signed-rank tests; two-tailed alpha level *p* < 0.05.

^e *p* Change in cotinine, hookah lounge vs. home.

^e *p* values were derived from Mann-Whitney U tests; two-tailed alpha level *p* < 0.05.

^f M ± SD = Arithmetic mean and Standard Deviation.

^g GM (95% CI) = Geometric mean and 95% Confidence Interval.

^h % Above LOD = Percentage of urine samples above the Limit of Detection (LOD); cotinine LOD = 0.1 ng/mL.

ⁱ Freq/n = Frequency of samples with levels above the LOD / n-size of samples per group.

^j Missing values: interference (n=4), missing samples (n=1).

Significant levels are bolded.